ABSTRACT

Marginal integrity of Bulk vs Incremental Fill Class II composite restorations using total etch and self etch bonding systems- SEM study.

Aim: The aim of this *in vitro* study is to evaluate the marginal integrity of Bulk (4mm placement)vs Inceremental Fill (2mm placement) of Class II composite restorations using Total Etch and Self Etch bonding systems and to analyse it using Scanning Electron Microscopy after thermocycling each tooth samples.

Methodology:30 human maxillary premolars were used. On each premolar, class II mesial and distal box only cavities were prepared and the proximal gingival margin was placed 1 mm above the CEJ on one side and 1 mm below it on the other side of the tooth. Consequently, two restorations were inserted in each premolar using the same bonding agent, restorative material, and technique, the only difference being the location of the cervical margin.

The teeth were initially divided into two groups based on the gingival floor position(enamel and cementum). Then each of these 2 groups were randomly divided into 2 main study groups based on composite placement technique - Incremental technique and Bulk Fill and then subdivided according to the bonding agent used as Self Etch and Total Etch technique and a control group (n=12). *Group 1*: Self Etch bonding agent and Incremental composite

placement. *Group 2*: Self Etch bonding agent and Bulk Fill Composite placement. *Group 3*: Total etch and Incremental Composite placement. *Group 4*: Total etch and bulk fill composite placement. *Group 5:* Control group: Bulk fill composite placement. All the samples were thermocycled in water baths and SEM analysis of the marginal integrity was done. The results were then statistically analysed.

Result: No significant difference was present in perfect margin distribution between enamel and cementum category. There was no significant difference found in the perfect margins that were formed between composite and tooth with the use of different adhesives(Self Etch and Total Etch) in the current study($p > 0.05$) .The total etch group showed slightly higher percentage of perfect margins that ranged from 75% to 91 % and that of self etch ranged from 58% to 83% in enamel and cementum .Where as a significant difference($p = 0.02$) in comparison of perfect margin was found between the total etch group and the control group where the total etch group showed better margins($p<0.05$) .And in relation to the composite placement technique used, incremental placement technique of composite resin showed slightly more percentage of perfect margin than bulk fill. The percentage of perfect margin with incremental fill was 75% to 91% and that for bulk fill was 58% to 75 % for enamel and cementum but there was no much significant difference between both ($p = 1.00$)where $p>0.05$).While comparing the two technique

with the control group , incremental technique showed a better marginal integrity (p=0.02) than bulk fill technique(p=0.08).

Conclusion: Marginal integrity was not significantly influenced by the use of bulk-fill materials, bonding techniques, or variation in the location of cervical margins.An insgnificantly better marginal integrity was found at enamel than on non enamel (cementum) margin. An insignificantly better marginal integrity was found when Total Etch bonding agent and Incremental placement of composite resin was used compared to Self etch and Bulk fill. A significantly better margins was found in Total Etch and Incremental technique when compared to the control group.

Keywords: Resin Based Composites, Total Etch, Self Etch, Incremental technique, Bulk Fill, Scanning Electron Microscopy.